individual licenses, so long as their operation comports with the conditions of §21.909(f). In addition, for the reasons detailed in the Explanatory Note to proposed §21.901(g), proposed subsection (b) requires that digital modulation be employed for any 6 MHZ channels that are turned around for response station transmissions.

Proposed subsection (c) provides, for the first time, a mechanism by which licensees can secure authorization to use response channels, whether they are turning around all or part of 6 MHZ channels or employing the existing 125 kHz channels. As noted above, response stations will not be individually licensed, only response station hubs. In order to establish that the response stations associated with a given response station hub will not cause harmful interference, it is essential that the location of response stations be limited. Therefore, the Petitioners contemplate that the applicant will specify a response service area -- the area where it can establish response stations that will not cause harmful electromagnetic interference to others. In order to provide maximum reliability of service, response station service areas may overlap one another. This will increase the likelihood that service can be provided to a given subscriber location, even if terrain, foliage or other restrictions make it impossible to connect to a given response station hub.

Under proposed subsection (c), an applicant for authority to establish response stations will be required to submit an application on FCC Form 304 that, among other things, identifies the location of the proposed response station hub, designates the channel plan that will be employed in communicating with the hub, specifies the geographic area that will be served by the hub and provides certain technical information (such as maximum power levels and polarization(s)) regarding the operation of the response stations that will be installed in each region of the proposed response service area. Allowing applicants the flexibility to specify different technical parameters for different regions of the proposed response service area (which regions will be determined by the applicant) provides applicants the flexibility to tailor their system design in a manner that best accomplishes operational objectives without resulting in harmful electromagnetic interference. As is discussed below and in the Two-Way Report, the submission of this information is essential both to determine whether the proposed response station operations will cause harmful electromagnetic interference and to assure that such operations are adequately protected from interference thereafter.

Proposed subsections (c)(3)(A) and (B) establish two restrictions on the location of response station hubs and response stations. Subsection (c)(3)(A) mandates that the response station hub be located within a protected service area associated with an authorization issued to the applicant. It is envisioned that the Commission will permit response station hubs to be located at the wireless cable headend, at MDS booster stations, or at any other location, so long as they are within the existing protected service area of the MDS station being turned around (if all or part of a 6 MHZ channel will be used for return paths), or within the existing protected service area of the primary station where a 125 kHz return path is being used. The Commission has previously recognized that return links from wireless cable subscribers need not necessarily terminate at the wireless cable transmission headend, and has authorized those return links to terminate at any facility of the wireless cable operator. See Spectrum Utilization Policy, 56 R.R.2d at 1181. Subsection (c)(3)(B) dictates that the response service area be located entirely within a protected service area associated with an authorization issued to the applicant, unless the applicant has secured the consent of an adjacent protected service area rights holder to an overlap between its protected service area and the proposed response service area. This will provide a vehicle by which response stations can be

located outside of the protected service area of a station whose channels are being turned around, just as today subscriber locations can be established beyond the boundaries of a station's protected service area.

Proposed subsections (c)(3)(C)-(G) require that the application for a response station hub authorization demonstrate that the proposed response stations will not cause harmful electromagnetic interference to authorized or previously proposed neighboring facilities. Under current rules, ITFS stations, incumbent MDS stations and BTA/PSA authorization holders are each entitled to different measures of protection against harmful electromagnetic interference. The intent of the proposed rules is to maintain those distinctions to the maximum degree possible so that the fundamental interference protection policies established over the years are not altered.

The Petitioners believe it is essential to expedite the authorization of response station hubs, and are advancing two proposals designed to avoid unnecessary regulatory delay. First, in order to avoid strike applications and the need for comparative evaluation of competing applications, proposed subsection (d) provides that applications for response station hub authorizations will be cut off from competing applications on the day of filing. This one-day rolling window approach proved effective in eliminating strike MDS applications in the early 1990s prior to the advent of auctions, and should prove similarly effective here. A response station hub will not be entitled to protection from interference caused by facilities proposed on or prior to the day the application is filed, and will not be required to protect from interference facilities proposed on or after the day the response station application is submitted. Where applications are submitted on the same day proposing facilities that interfere with each other, the burden of resolving the conflict will be shifted from the Commission to the parties involved. Meanwhile, however, either party is free to commence service almost immediately (albeit subject to possible interference).

Second, the Petitioners are proposing under proposed subsection (e) that applications for response station hub authorizations be automatically granted on the 61st day after appearing on public notice as accepted for filing, unless a petition to deny or other formal objection is timely filed by a party in interest or the Commission has previously notified the applicant that its application will not be automatically granted. In crafting this proposal, the Petitioners have balanced the need to assure interference protection in crowded spectrum against regulatory delays associated with extensive Commission review and confirmation of complex interference analyses. In many services, such as Personal Communications Services, the General Wireless Communications Service, and the proposed Local Multipoint Distribution Service and Wireless Communications Service, individual facilities need not even be licensed once a block grant has been issued. While that approach is deemed by Petitioners to be too radical for services like the MDS and ITFS where the spectrum is heavily encumbered, it does illustrate that the Commission can largely rely on industry self-policing to assure interference protection. As contemplated by Petitioners, an application for a response station hub authorization would be placed on public notice by the staff after review as to form and a determination that all previously proposed and licensed facilities have been analyzed for potential interference, but without extensive review and verification of the interference studies submitted by the applicant. Potentially affected parties (all of whom must be served with a copy of the application pursuant to proposed subsection (c)(4)) would have sixty days from public notice in order to formally oppose grant of the application. If those potentially affected parties do not object, the application should be deemed automatically granted as of the 61st day following public notice. As proposed, the rule would provide the staff with the authority under unusual circumstances to advise

the applicant prior to the 61st day that its application will not be automatically granted, in which case the application will be subject to the normal processing routine. In addition, the Commission would retain the 40-day period provided for under §1.117(a) of the Rules to reconsider any automatic grant on the Commission's own motion. The proposed approach shifts the burden of reviewing the detailed technical components of response station proposals from the Commission to the industry, freeing Commission resources for other tasks (such as resolving contested cases more rapidly than is presently possible) while still providing a vehicle for assuring protection against interference.

Proposed subsection (f) specifies the conditions that will be placed upon all authorizations to install and operate response stations. The proposed language essentially incorporates existing restrictions in §21.909 on MDS response stations, while adding restrictions to assure that response stations are operated in a manner consistent with the underlying application. Although not specifically stated in proposed subsection (f), the Petitioners contemplate that the construction deadline provisions of §21.43 will apply to response station hub authorizations, and that hubs authorized to incumbent MDS licensees will have to be constructed within twelve months of the date of grant unless the Commission grants an application for additional time to complete construction.

The proposed change to subsection (g) reflects that regulation of the listed channels is now governed by Part 101 of the Commission's Rules.

Proposed subsection (h) modifies the Commission's interference protection rules to provide protection from harmful electromagnetic interference to response station hubs authorized to MDS incumbents. Except where the same frequencies will be used for transmissions both from MDS response stations and from MDS stations or booster stations, traditional interference protection is eliminated within the area served by each response station hub (which is called a response service area), since there is no need to protect from cochannel and adjacent channel interference those sites that are within the response service area other than the response station hubs. Those hubs, however, must be protected. Because response station hubs are by definition multipoint-to-point facilities and are likely to be receiving signals from all azimuths, and because those signals are likely to be transmitted utilizing horizontal and vertical polarization, the proposed rule provides that an applicant for a new or modified station must assume use of a non-directional, plane polarized reception antenna at the response station hub, rather than the reference antenna that is assumed when performing point-to-multipoint interference analyses. Response station hubs authorized pursuant to BTA authorizations will continue to receive interference protection based on the -73 dBW/m² power flux density requirement at the border of the BTA.

Proposed subsection (i) makes clear that several Commission rules generally applicable to "licenses" will be applicable to MDS response station hub authorizations.

Proposed subsections (j) through (l) are intended to conform the provisions of this section to the provisions of proposed §§74.939(g) through (k), which are largely based on the existing rules governing 125 kHz response channel operations. The Petitioners are proposing that the spectral mask currently mandated for response stations be loosened, as the current mask unnecessarily restricts spectral efficiency. The Petitioners believe that the proposed revisions will permit a greater proportion of the existing 125 kHz response channel bandwidth to be employed, without unreasonably increasing the risk of harmful interference. For the reasons explained previously, the

Petitioners believe it is inappropriate for the Commission to impose unnecessarily restrictive frequency tolerance requirements on response stations, and that the spectral mask should be relied upon as the primary mechanism for restricting adjacent channel interference. This is particularly true given that it is anticipated that virtually all response stations will be operated using digital modulation, so the frequency offset techniques which are advanced by frequency tolerance requirements, will not be available in any event.

In order to assure a degree of uniformity among all interference analyses submitted, Note 1 to both this proposed rule and its ITFS sibling requires that signal level calculations be performed in accordance with a particular methodology that the Petitioners contemplate will be annexed to the Commission Report and Order adopting these rules. A draft of that methodology is annexed as Appendix C to the accompanying Petition. That methodology comprises a three-step process that involves (i) defining a measurement line and measurement points on that line that are used in determining that a large enough number of points are used to statistically represent the potential universe of response stations in analyzing the interference they will cause, then (ii) determining the number of points that actually must be used in predicting interference, and finally (iii) prescribing the method by which the points determined in the second step should be used in the various interference analyses.

As is explained in the Two-Way Report, in order to determine the interference that will be caused by the aggregated signals from the response stations within a response service area, it is necessary that certain characteristics of the response stations be enumerated. To permit flexibility in the design of systems, provision is made for the definition of discrete regions within each response service area and regional classes of characteristics through which different sets of the various limits can be applied to each region. Thus, it will be required that applicants specify the maximum effective isotropic radiated power (EIRP) and the maximum antenna height above ground to be used by response stations associated with specific regional classes. It will also be necessary to specify the worst case combined antenna pattern to be used by any response station associated with each regional class and the maximum number of response stations to be associated with each regional class that will be used simultaneously.

The characteristics of the system that determine the number of transmitters simultaneously sharing the channel or sub-channels, thereby controlling the interference emanating from the response service area, are required to be specified. For certain kinds of system designs, assumptions are necessary with respect to such matters as the percentage of response stations that can be expected to be using the system during peak use periods and the percentage of response stations using the system that could be trying to transmit simultaneously in systems that depend upon statistical methods to control access to the channel. Such assumptions can be drawn from experience with similar data or telecommunications networks used in other applications.

The result of the process described is an array of locations to be used in interference analyses, each having one or more groups (classes) of transmitter EIRP values, antenna heights, and radiation patterns associated with it. The array then serves to represent, on a statistical basis, the totality of response stations that eventually will be installed. The method for summing the signals from the representative array is also described.

When any of the parameters specified in the response station hub authorization application or in the

studies supporting it must be exceeded or altered, e.g., the number of response stations within a regional class, the combined worst case antenna pattern, the maximum antenna height, the maximum EIRP, or the network system design or statistics, an application proposing modification of the authorization generally must be filed and must undergo the same approval process as an original application. However, a simple notification can be employed where minor changes are proposed under circumstances where the potential for interference does not increase.

17. Section 21.913 is revised as follows:

§21.913 Signal booster stations.

(a) Authorizations for Multipoint Distribution Service (MDS) booster stations may be granted to an MDS ~~applicant,~~ conditional licensee or licensee, ~~to an Instructional Television Fixed Service (ITFS) applicant, permittee or licensee,~~ or to a third party with a fully-executed lease or consent agreement with an MDS ~~or ITFS applicant~~, conditional licensee, ~~permittee~~ or licensee. An MDS booster station may reuse channels to repeat the signals of MDS stations or for the origination of signals on MDS channels. An MDS booster station authorized pursuant to subsection (b) may only be licensed to an MDS licensee or conditional licensee, and may operate only on one or more MDS channels that are licensed to the licensee of the MDS booster station. An MDS booster station authorized pursuant to subsection (e) may be licensed to an MDS licensee or conditional licensee or to a third party with a fully-executed lease or consent agreement with an MDS conditional licensee or licensee, and may operate only on one or more MDS channels that are licensed to or leased by the licensee of the MDS booster station. No booster station may be authorized for the reuse of channels authorized to ~~retransmission of signals for~~ an MDS, ~~ITFS or OFS~~ station without the written consent of the licensee of the station whose channels are reused ~~signals are retransmitted~~. The aggregate power flux density generated by an MDS station and all associated signal booster stations may not exceed -73 dBW/m² (or, when subchannels are used, the appropriately adjusted value based upon the ratio of the channel-to-subchannel bandwidths) at or ~~extend service~~ beyond the boundaries of the protected service area of any ~~an~~ MDS station's ~~protected service area~~ whose channel is being reused, as measured at locations for which there is an unobstructed signal path, unless the consent of the adjoining cochannel protected service area licensee is obtained. ~~No booster station may be authorized for the retransmission of signals for an MDS, or ITFS or OFS station without the written consent of the licensee of the station whose signals are retransmitted.~~

(b) Any eligible party under §21.913(a) may secure an authorization for an MDS signal booster that has a maximum power level in excess of -9 dBW EIRP (or, when subchannels are used, the appropriately adjusted value based upon the ratio of the channel-to-subchannel bandwidths) by submitting an application on FCC Form 304 and including, in addition to the requirements of that form:

(1b) ~~In addition to the other application requirements of this part, each application for a signal booster station that would retransmit an MDS signal must certify~~ A demonstration that the proposed booster station site is within the protected service area, as defined in §§21.902(d), ~~and~~ 21.933 and 74.903(d), of every ~~any~~ incumbent MDS or ITFS stations whose channels are to be reused; and:

(2c) ~~In addition to the other application requirements of this part, each application for a signal booster station that would retransmit an MDS signal must state in the application that it has prepared a~~ A study which demonstrates that the aggregate power flux density of the MDS station and all associated booster stations at or beyond the boundary ~~the edge~~ of the ~~MDS~~ protected service areas of the MDS station whose channels are to be reused does not exceed -73.0 dBW/m^2 (or, when subchannels are used, the appropriately adjusted value based upon the ratio of the channel-to-subchannel bandwidths) at locations for which there is an unobstructed signal path ~~to the boundary~~ unless the consent of the adjoining protected service area licensee has been obtained; and

(3d) In ~~addition to the other application requirements of this part~~, lieu of the requirements of §§21.902(c) and (i), ~~each application for a signal booster station must state in the application that is has prepared~~ a study which demonstrates that the proposed booster station will cause no harmful interference to co-channel and adjacent-channel existing or previously-proposed ITFS and MDS stations with protected service area center coordinates as specified in §21.902(d) or, in the case of ITFS stations without protected service areas, transmitters, within 160.9 ~~80.5~~ kilometers (100 ~~50~~ miles) of the proposed booster station's transmitter site, or any ITFS or MDS response station hubs or booster stations within 160.94 kilometers (100 miles) of the proposed booster station's transmitter site. In the alternative, a statement from the MDS or ITFS permittee, licensee or conditional licensee stating that it does not object to operation of the MDS signal booster station may be submitted; and

(4e) ~~In addition to the other application requirements of this part, each application must include a~~ A written consent statement of the licensee of each MDS and~~,~~ ITFS~~, and OFS~~ station whose channel ~~signal~~ is reused; and ~~retransmitted.~~

~~(f) The output power of the signal booster transmitter station must not exceed 18 dBW EIRP.~~

(5) A specification of the area to be served by the booster (the "booster service area"), which may not overlap the booster service area of any other booster authorized to or proposed by the applicant; and

(6) A demonstration either (i) that the booster service area is entirely within the protected service area to which each licensee of a station whose channels are being reused is entitled either (a) by virtue of its being the licensee of an incumbent MDS station whose channels are being converted for MDS response station use, or (b) by virtue of its holding a Basic Trading Area or Partitioned Service Area authorization; or (ii) that the licensee entitled to any protected service area which is overlapped by the proposed booster service area has consented to such overlap; and

(7) A demonstration that the proposed booster service area can be served by the proposed booster without interference; and

(8) A certification that copies of the materials set forth in this §21.913(b) have been served upon the licensee, conditional licensee or permittee of each station

(including each response station hub and booster station) required to be studied pursuant to §21.913(b)(3) and the holder of any Basic Trading Area or Partitioned Service Area authorization adjoining the proposed booster service area.

(c) Notwithstanding the provisions of §21.901(d)(4) and except as provided in §21.27(d), applications for booster station authorizations may be filed at any time. Notwithstanding any other provision of Part 21 (including §21.31), applications for booster authorizations meeting the requirements of §21.913(b) shall be cut-off from applications for facilities that would cause harmful electromagnetic interference on the day of filing. A booster station shall not be entitled to protection from interference caused by facilities proposed on or prior to the day the application for the booster station authorization is filed. Booster stations shall not be required to protect from interference facilities proposed on or after the day the application for the booster station authorization is filed.

(d) Notwithstanding the provisions of §21.30(b)(4), any petition to deny an application for a booster station authorization shall be filed no later than the sixtieth (60^{th}) day after the date of public notice announcing the filing of such application or major amendment thereto. Notwithstanding any other provision of this Part 21, an application for an MDS booster station authorization that meets the requirements of §21.913(b) shall automatically be granted on the sixty-first (61^{st}) day after the Commission shall have given public notice of its acceptance for filing, unless prior to such date either a party in interest timely files a formal petition to deny or for other relief pursuant to §21.30(a) or the Commission notifies the applicant that its application will not be automatically granted. Where an application is automatically granted pursuant to the provisions of this subsection, the licensee shall maintain a copy of the application at the MDS booster station until such time as the Commission issues a booster station authorization.

(eg) An eligible party pursuant to §21.913(a) ~~MDS or ITFS licensee~~ may install and commence operation of a signal booster station that has a maximum power level of -9 dBW EIRP (or, when subchannels are used, the appropriately adjusted value based upon the ratio of the channel-to-subchannel bandwidths) ~~and that does not extend service beyond the boundaries of an MDS station's protected service area or beyond an ITFS licensee's registered receive site~~, subject to the condition that for sixty (60) days after installation, no objection or petition to deny is filed by an authorized co-channel or adjacent-channel ITFS or MDS station with a transmitter within 8.0 kilometers (5 miles) of the coordinates of ~~the primary transmitter of~~ the signal booster. An eligible party pursuant to §21.913(a) ~~MDS or ITFS licensee~~ seeking to install a signal booster under this rule must, within 48 hours after installation, submit (i) a description of the signal booster technical specifications (including an antenna envelope plot or, if the envelope plot is on file with the Commission, the make and model of the antenna, antenna gain and azimuth), the coordinates of the booster, the height of the center of radiation above mean sea level, the street address of the signal booster and a description of the area to be served by the signal booster (the "booster service area"), (ii) a demonstration that the booster service area is entirely within the protected service area to which each licensee of a station whose channels are being reused is entitled either (a) by virtue of its being the licensee of an incumbent MDS station whose channels are being converted for MDS response station use, or (b) by virtue of its holding a Basic Trading Area or Partitioned Service Area authorization, or, in the alternative, that the

licensee entitled to any protected service area which is overlapped by the proposed booster service area has consented to such overlap; and a demonstration that the proposed booster service area can be served by the proposed booster without interference; (iii) either a certification that no Federal Aviation Administration determination of No Hazard to Air Navigation is required under Part 17 of this chapter or, if such determination is required, either: (a) a statement of the FCC Antenna Structure Registration Number; or (b) if an FCC Antenna Structure Registration Number has not been assigned for the antenna structure, the filer must indicate the date the application by the antenna structure owner to registered the antenna structure was filed with the FCC in accordance with Part 17 of this chapter. and (iv) a certification that:

(1) The maximum power level of the signal booster transmitter does not exceed -9 dBW EIRP (or, when subchannels are used, the appropriately adjusted value based upon the ratio of the channel-to-subchannel bandwidths); and

~~(2) A description of the signal booster technical specifications (including antenna gain and azimuth), the coordinates of the booster and receivers, and the street address of the signal booster, and a specification of the area to be served by the signal booster;~~

(~~2~~3) No registered receiver of an ITFS E or F channel station, constructed prior to May 26, 1983, is located within a 1.61 km (1 mile) radius of the coordinates of the booster, or in the alternative, that a consent statement has been obtained from the affected ITFS licensee; and

(~~3~~4) No environmental assessment location as defined at §1.1307 of this chapter is affected by installation and/or operation of the signal booster; and

(~~4~~5) Each MDS and/or ITFS station licensee (including the licensees of booster stations and response station hubs) with protected service areas or registered receivers within a 8.0 km (5 mile) radius of the coordinates of the booster has been given notice of its installation; and

(~~5~~6) Consent has been obtained from each MDS ~~or ITFS~~ station licensee whose signal is reused ~~repeated~~ by the signal booster; and

(~~6~~7) The signal booster site is within the protected service area of the MDS stations whose channels are to be reused~~, if the signal of an MDS station is repeated~~; and

(~~7~~8) The aggregate power flux density of the MDS stations to be reused and their associated booster stations at or beyond the boundary ~~the edge~~ of the ~~MDS station's~~ protected service areas of the MDS stations to be reused does not exceed -73.0 dBW/m^2 (or, when subchannels are used, the appropriately adjusted value based upon the ratio of the channel-to-subchannel bandwidths) at locations for which there is an unobstructed signal path; and~~, if the signal of an MDS station is repeated~~;

~~(9) The antenna structure will extend less than 6.10 meters (20 feet) above~~

~~the ground or natural formation or less than 6.10 meters (20 feet) above an existing manmade structure (other than an antenna structure); and~~

(~~8~~10) The MDS booster station filer ~~licensee~~ understands and agrees that in the event harmful interference is claimed by the filing of an objection or petition to deny, the licensee must terminate operation within two (2) hours of written notification by the Commission, and must not recommence operation until receipt of written authorization to do so by the Commission.

(f) An applicant for any new or modified MDS or ITFS station (including a response station hub authorization or a booster station) shall demonstrate compliance with the desired to undesired signal ratio protected service area protection requirements set forth in §§21.902, 21.938 and 74.903 with respect to the portion of any previously proposed or authorized booster service area that is within the protected service area of a primary incumbent MDS station by using the transmission parameters of the MDS booster station (including EIRP, polarization(s) and antenna height) with respect to those channels authorized to an incumbent MDS station that are being reused. Upon the filing of a certification of completion of construction for an MDS booster station applied for pursuant to §21.913(b) or upon the filing of an MDS booster station notification pursuant to §21.913(e), each incumbent MDS station whose channels are being reused by the MDS signal booster shall no longer be entitled to interference protection pursuant to §§21.902(b)(3) and (4), 21.938(b)(2) and (3) and 74.903 within the booster service area based on the transmission parameters of the incumbent MDS station whose channels are being reused. A booster station shall not be entitled to protection from interference caused by facilities proposed on or prior to the day the application or notification for the booster station is filed. Booster stations shall not be required to protect from interference facilities proposed on or after the day the application or notification for the booster station is filed.

EXPLANATORY NOTE — The proposed revisions to §21.913 are generally designed to accommodate the proposed origination of signals by MDS booster stations, to reflect that in distributed transmission systems boosters (which will be akin to cells in cellular systems) will operate in some cases at higher powers than currently allowed, to clarify that MDS booster stations may only operate on MDS channels (with ITFS boosters authorized pursuant to §74.985 operating on ITFS channels) and to provide a streamlined regulatory process that will allow the rapid introduction of such stations into the operating environment without undue risk of interference.

The proposed changes to subsection (a) achieve the objective of allowing signal booster stations to originate information as well as retransmit information from primary stations. The changes also reflect that since booster stations will be allowed to originate, they should only be authorized once the underlying application for a primary station has been granted. Because boosters have historically been limited to a retransmission role, as a practical matter boosters could not be placed into operation until a primary station had been licensed. Because the current rule allowed mere applicants to secure booster authorizations, it was possible for a booster to be authorized prior to the underlying primary station. That flaw was of no moment, however, because the booster could not operate without the signal of a primary station to retransmit. Now, since boosters can originate information, the rule should be revised so only licensees and conditional licensees and their lessees

can secure booster authorizations.

References to ITFS "permittees" have been eliminated, since the Commission has adopted one-stop licensing for ITFS and no longer issues construction permits. An ITFS licensee can, however, be the licensee of an ITFS booster station authorized under §74.985 of the Rules. Finally, the proposed revisions to subsection (a) clarify the signal level that an MDS booster station can transmit outside of the protected service area of the primary station by specifically incorporating the -73 dBW/m² power flux density currently specified in §21.913, eliminating ambiguity that is present under the current rule.

The proposed rules provide new mechanisms for the expedited introduction of booster service. Proposed subsections (b), (c) and (d) generally provide for the filing of applications for MDS signal boosters that will operate with power in excess of -9 dBW EIRP. Because of the higher power at which these boosters will operate and the increased potential for harmful interference, the proposed rule requires that a formal application be filed with the Commission and served upon the licensees of neighboring facilities. In addition, because of the high power at which boosters will be able to operate, the Petitioners are proposing an increase in the coordination distance in order to be consistent with the interference analysis requirement imposed on regular MDS transmitters. The filer will have to demonstrate that the proposed booster is within the protected service area of the primary station, that it will not cause the power flux density at the boundary of that protected service area to exceed -73 dBW/m², and that it will not cause harmful interference to incumbent MDS and ITFS stations. The proposal requires that the application for a booster station authorization demonstrate that the proposed station will not cause harmful electromagnetic interference to authorized or previously proposed neighboring facilities. Under current rules, ITFS stations, incumbent MDS stations and BTA/PSA authorization holders are each entitled to different measures of protection against harmful electromagnetic interference. The intent of the proposed rule is to maintain those distinctions to the maximum degree possible so that the fundamental interference protection policies established over the years are not altered.

Note that while the proposed rule speaks solely of a power flux density limitation of -73 dBW/m² at the boundary of the protected service area, the Commission has allowed those incumbent MDS and ITFS stations that currently exceed that limitation to make modifications on a grandfathered basis so long as the power flux density at the boundary is not increased. MDS Auction Order, 10 FCC Rcd at 9618. The Petitioners contemplate that the Commission will continue to employ that approach. Thus, where an incumbent MDS or ITFS station exceeds the -73 dBW/m² limitation at present, the Petitioners contemplate that the licensee would be able to add booster facilities, so long as the power flux density is not increased at any location along the protected service area boundary.

In order to avoid the need for comparative evaluation of competing booster applications, proposed subsection (c) provides that applications for booster authorizations will be cut off from competing applications on the day of filing. A booster station will not be entitled to protection from interference caused by facilities proposed on or prior to the day the application is filed, and will not be required to protect from interference facilities proposed on or after the day the booster application is submitted. Where applications are submitted on the same day proposing facilities that interfere with one another, the burden of resolving the conflict will be shifted from the Commission to the parties involved. Meanwhile, however, service to those areas that will not suffer interference can commence immediately.

As with response stations, the Petitioners are proposing that applications for these higher power signal boosters be automatically granted on the 61st day after the Commission gives public notice of the filing of such application. Thus, the burden of reviewing the technical content of booster station applications will be shifted from the Commission to licensees and applicants. This approach will free the Commission staff to focus its resources on contested cases. Routine applications will be granted speedily as a matter of course while contested cases can be resolved more rapidly, as the staff will be freed to devote greater resources to those cases.

The proposed subsection (e) addresses the installation and operation of boosters operating at -9 dBW EIRP or less, and generally reflects the current notification policies relating to the installation and operation of low power boosters, with minor changes made from the current rules to conform to changes in subsections (a) and (b).

Subsection (f) introduces an essential new concept — interference protection for the service rendered by signal booster stations. When the Commission first considered the possibility of amending its rules to foster the use of cellular technology by MDS licensees, it recognized that cellularizing the service would require an adjustment to its interference protection rules. See Amendment of Parts 21 and 74 of the Commission's Rules with Regard to Filing Procedures in the Multipoint Distribution Service and in the Instructional Television Fixed Service, 1 CR 1, 24 (P&F 1995). Although the current rules permit boosters, the Commission has never specified interference protection rules for those boosters. Ironically, the result is that some service is overprotected. For example, an applicant for a new station attempting to demonstrate protection to a neighbor's protected service area may find it impossible to show that it will protect service from the neighbor's primary transmitter, when in fact the area in question is served by a booster that is cross-polarized to the primary station and will not be adversely affected by the launch of new service. The Commission has recognized that the most difficult element of providing interference protection in a cellularized environment is determining which transmitter will provide the desired signal. See id. Subsections (b) and (e) require the filer of a booster station application or notification to specify the area to be served by the booster, eliminating that concern.

No change is proposed with respect to the protection of booster stations authorized as a result of BTA authorizations -- it is contemplated that the BTA holder will continue to receive protection from the -73 dBW/m² power flux density limit at the BTA border. A primary objective of the Petitioners, however, has been to provide incumbent MDS and ITFS stations with a level of protection akin to that they receive under the current rules, while avoiding the overprotection problem discussed above. Where a booster is licensed to an incumbent MDS licensee, the proposed rule provides that a subsequent applicant for a new or modified facility will only have to demonstrate that it will protect any previously proposed or authorized specified booster service area using the technical configuration of the booster station that is actually serving the area, including the EIRP, polarization(s) and antenna heights. No longer will the incumbent MDS licensee receive protection within its protected service area calculated based on the signal of a primary transmitter that is not, in fact, providing service. Where a booster service area is extended for a given channel beyond the 35 mile protected service area of an incumbent MDS station with the consent of the BTA authorization holder, it is contemplated that the 45 dB/0 dB interference protection will only apply to that portion of the booster service area within the 35-mile protected service area. This is intended to avoid increasing the level of interference protection afforded a BTA authorization holder beyond the -73 dBW/m² it is entitled to at the boundaries of its protected service area. If a booster

authorization is canceled, it is contemplated that protection would revert back to being based on the initial technical configuration of the primary station (although any interference caused by facilities proposed or authorized in the interim will have to be grandfathered). Note that applicants are barred from proposing overlapping booster service areas. While service providers should be free to serve a given receive site from any booster station, regardless of whether the receive site is within that booster's service area, the proposed bar on overlaps will avoid over-protection of service. That, in turn, will prevent the unnecessary preclusion of service on adjacent channels or in adjacent markets. The Petitioners believe that the approach suggested in the proposed rules will provide an appropriate level of interference protection, while at the same time not unnecessarily precluding service in neighboring areas or using adjacent channels.

Although not specifically stated in proposed §21.913, the Petitioners contemplate that the construction deadline provisions of §21.43 will apply to booster authorizations obtained pursuant to §21.913(d) and that higher power booster stations authorized to incumbent MDS licensees will have to be constructed within 12 months of the date of grant unless the Commission grants an application for additional time to complete construction.

18. Section 21.925(b) is amended as follows:

(b) Separate long-form applications must be filed for each individual MDS station license sought within ~~its~~ the protected service area of a BTA or PSA, including:

(1) an application for each E-channel group, F-channel group, and single H, 1, and 2A channel station license sought;

(2) an application for each MDS response station hub authorization sought;

(3) an application for each MDS booster station that will operate with an EIRP in excess of -9 dBW (or, when subchannels are used, the appropriately adjusted value based upon the ratio of the channel-to-subchannel bandwidths); and

(~~4~~2) an application for authority to operate at an MDS station in the area vacated by an MDS station incumbent that has forfeited its station license; and

(~~5~~3) an application for each ITFS-channel group station license sought in accordance with §§74.990 and 74.991.

EXPLANATORY NOTE — The proposed revision to subsection (a) corrects an inadvertent error in the drafting of the current rule. The proposed addition of subsection (b)(2) conforms to §21.909 (which requires the filing of an application for authority to install and operate MDS response stations and their associated response station hubs) and §21.913(b) (which requires the filing of an application for authority to install and operate MDS booster stations that will operate with an EIRP in excess of -9 dBW).

19. Section 21.938(b) is revised as follows:

(b) Unless the affected parties have executed a written interference agreement in accordance with §21.937, and subject to the provisions of §§21.909, 21.913, 74.939 and 74.985 regarding the protection of response station hubs and booster stations from harmful electromagnetic interference, stations licensed to a BTA or PSA authorization holder must not cause harmful electromagnetic interference to the following:

(1) the protected service area of other authorization holders in adjoining BTAs or PSAs.

(2) the 56.33 km (35 mile) protected service areas of authorized or previously proposed MDS stations (incumbents).

(3) registered receive sites and protected service areas of authorized or previously proposed stations in the Instructional Television Fixed Service pursuant to the manner in which interference is defined in §74.903(a).

EXPLANATORY NOTE — The proposed additional language is intended to conform §21.938(b) to the new interference protection rights afforded MDS and ITFS response stations and booster stations under §§21.909, 21.913, 74.939 and 74.985.

20. Section 74.901 is revised by amending the definitions of "ITFS response station" and by adding definitions for "Response station hub" and "Signal booster station" as follows:

ITFS response station. A fixed station operated by an ITFS licensee, the lessee of ITFS channel capacity or a subscriber of either at an authorized location to provide communication by voice, video and/or data signals with a response station hub ~~to an associated instructional television fixed station~~. A response station licensed under this part may share facilities with other ITFS response stations and/or one or more MDS response stations authorized pursuant to §21.909.

Signal Booster Station. An ITFS station licensed for use in accordance with §74.985 that operates on one or more ITFS channels. Signal booster stations are intended to augment service as part of a distributed transmission system where signal booster stations retransmit the signal of an ITFS station and/or originate information. A signal booster station licensed under this part may share facilities with other ITFS signal booster stations and/or one or more MDS signal booster stations authorized pursuant to §21.913.

Response Station Hub. A fixed facility licensed to an ITFS licensee and operated by an ITFS licensee or the lessee of an ITFS channel for the reception of information transmitted by one or more ITFS or MDS response stations. A response station licensed under this part may share facilities with other ITFS response station hubs and/or one or more MDS response station hubs authorized pursuant to §21.909.

EXPLANATORY NOTE — Like the proposed changes to §21.2 relating to the MDS, the proposed

revisions to §74.901 serve several purposes relating to the ITFS. The accompanying Petition proposes three fundamental changes to the Commission's regulatory regime for ITFS -- permitting cellularizing of transmission facilities, permitting subchannel and superchannel use of ITFS channels, and the permitting the use of 6 MHZ channels for return communications. In order to minimize the disruption to the current rules, it is proposed (i) that the current ITFS response station concept of §74.939 be expanded to govern all return paths, not just those using the 125 kHz channels, and (ii) that the current booster station concept of §74.985 be expanded to provide for origination of communications.

The definition of an "ITFS response station" is revised to reflect the proposal that entire ITFS channels may be turned around and therefore the response station will not necessarily be associated with any particular point-to-multipoint facility. The proposed revision also permits the use of response channels for video return paths, conforming to the MDS response station rule. In addition, the proposed revisions eliminate the implication of the current definition that the response station must communicate directly with the ITFS transmitter site. The Petitioners are proposing the use of response station hubs as an alternative that will permit ITFS response stations to operate at lower power (since the response station hubs will generally be located closer to receive site premises than the current primary transmitter site) and to employ a cellular pattern that will permit greater frequency reuse than if each receive site must communicate with the current primary transmitter site.

As noted in the explanatory note to §21.2, the Petitioners contemplate that response station hub authorizations generally will be issued to the holder of an existing point-to-multipoint authorization. Particularly since the Petitioners anticipate that adjacent channels (which are usually assigned to different licensees as a result of the interleaved channel allocation pattern in the 2.5 GHz band) will be reserved for response station transmissions, it is likely that most hubs and associated response stations will be facilities shared by multiple licensees. In other words, a response station hub and associated response stations will operate under multiple authorizations, which will be identical in all respects other than in the name of the licensee and the authorized channels of operation.

The definition of "Signal Booster Station" is added, and reflects that such stations will be authorized to originate transmissions, as well as relay transmissions from other stations. As with response stations, it is anticipated that ITFS signal booster facilities will be shared by multiple licensees comprising a wireless cable system.

21. Sections 74.902(d) is amended as follows

> (d)(1) A licensee is limited to the assignment of no more than four channels for use in a single area of operation, all of which should be selected from the same Group listed in paragraph (a) of this section unless good cause to utilize channels from multiple Groups is shown. An area of operation is defined as the area 20 miles or less from the ITFS transmitte. Applicants shall not apply for more channels than they intend to construct within a reasonable time, simply for the purpose of reserving additional channels. The number of channels authorized to an applicant will be based on the demonstration of need for the number of channels requested. The Commission will take into consideration such factors as the amount of use of any currently assigned channels and the amount of proposed use of each channel requested, the amount of, and justification for, any repetition in the

schedules, and the overall demand and availability of ITFS channels in the community. For those applicant organizations formed for the purpose of serving accredited institutional or governmental organizations, evaluation of the need will only consider service to those specified receive sites which submitted supporting documentation pursuant to §74.932(a)(4).

(2) An applicant leasing excess capacity and proposing a schedule which complies in all respects with the requirements of §74.931(e) will have presumptively demonstrated need, in accordance with paragraph (d)(1) of this section, for no more than four channels~~, all part of the same Group listed in paragraph (a) of this section~~. This presumption is rebuttable by demonstrating that the application does not propose to comport with our educational programming requirements, that is, to transmit some formal educational programming, as defined in §74.931(a), and to transmit the requisite minimum programming of §74.931(e) for genuinely educational purposes and to receive sites when students are there.

EXPLANATORY NOTE — The proposed revisions to subsection (d) are designed to accommodate a possible change in the current system of interleaved channel assignments. The Two-Way Report establishes that in order to avoid adjacent channel interference, it appears likely that those desiring to provide for return communications will want to utilize several contiguous channels. The current interleaved channel assignment system is inconsistent with that approach. Therefore, the proposed rule revision allows the Commission, upon a showing of good cause, to license ITFS licensees to utilize channels in different channel groups and therefore promote the licensing of contiguous channels. Note that §21.901(d)(6) establishes a procedure by which the licensees of interleaved MDS channels may petition the Commission to authorize an exchange of assigned channels to allow adjacent channel operation by a single licensee. The proposed revisions to subsection (d) are designed to provide a similar flexibility in the assignment of ITFS channels.

22. Section 74.903(a)(3) is amended as follows:

(3) For purposes of this section and except as set forth in §74.939 regarding the protection of response station hubs, all interference calculations involving receive antenna performance shall use the reference antenna characteristics shown in Figure 1, §74.937(a) or, in the alternative, utilize the actual pattern characteristics of the antenna in use at the receive site under study. If the actual receive antenna pattern is utilized, the applicant must submit complete details including manufacturer, model number(s), co-polar and cross-polar gain patterns, and other pertinent data.

EXPLANATORY NOTE — The proposed revision to subsection (3) is necessary because, as explained in the Explanatory Note to §21.909, the multipoint-to-point nature of the response station hub makes the standard reference antenna inappropriate for use in analyzing potential interference to a response station hub.

23. Section 74.903(b)(6) is added as follows:

(6) Special rules relating to response service areas and booster service areas are set forth in §§21.909, 21.913, 74.939 and 74.985. To the extent those special rules are inconsistent with any rules set forth above, those special rules shall control.

EXPLANATORY NOTE — This additional subsection is being added to assure that applicants for new or modified ITFS facilities are aware that proposed §§21.909, 21.913, 74.939 and 74.985 impose upon them special interference protection requirements relative to ITFS and MDS response stations and booster stations. The placement of the response station and booster station interference protection rules in those sections mirrors the proposed approach to specifying the protection due MDS response stations and booster stations.

24. Section 74.911(a)(1) is amended as follows:

(a) Applications for ITFS stations are divided into two groups:

(1) In the first group are applications for new stations or major changes in the facilities of authorized stations. These applications are subject to the provisions of paragraph (c) of this section. A major change for an ITFS station will be any proposal to add new channels, change from one channel (or channel group) to another, change polarization, increase the EIRP in any direction by more than 1.5 dB, increase the transmitting antenna height by 25 feet or more, or relocate a facility's transmitter site by 10 miles or more. Applications submitted pursuant to §§74.939 and 74.985 shall not be considered major change applications. However, the Commission may, within 15 days after the acceptance of an application, or 15 days after the acceptance of any other application for modification of facilities, advise the applicant that such application is considered to be one for a major change, and subject to the provisions of paragraph (c) of this section.

EXPLANATORY NOTE — The proposed revision provides that a request for authority to modify a licensed facility for return path use or to add a booster station shall not be considered a major change. This will avoid unnecessarily delaying the filing and processing of return path modification and booster applications until ITFS filing windows. It mirrors the approach taken by the Commission in the Digital Declaratory Ruling, where the Commission treated applications to convert to digital operations as minor amendments. See Digital Declaratory Ruling, at ¶ 53. Note, however, that just as the Commission required in the Digital Declaratory Ruling the preparation and filing of interference analyses by ITFS applicants that are generally not required with minor change applications, so too are the Petitioners proposing in §74.939(d) that applicants for response station hub and booster authorizations demonstrate that their proposed minor changes will not cause harmful interference.

25. Section 74.911 is revised by adding a new subsection (e) as follows:

(e) Notwithstanding any other provisions of this Part 74, effective as of [date of adoption of new rules], there shall be one one-week window at such time as the Commission

shall announce by public notice for the filing of applications for booster stations and response station hub authorizations, during which all applications shall be deemed to have been filed as of the same day for purposes of §§74.939 and 74.985. Following the publication of a public notice announcing the tendering for filing of applications submitted during that window, applicants shall have a period of sixty (60) days to amend their applications, provided such amendments do not result in any increase in interference to any previously proposed or authorized station (including facilities proposed during the window) absent consent of the applicant for or licensee of the station that would receive such additional interference. At the conclusion of that sixty (60) day period, the Commission shall publish a public notice announcing the acceptance for filing of all applications submitted during the initial window, as amended during the sixty (60) day period. All petitions to deny such applications must be filed within sixty (60) days of such second public notice. Each application submitted during the initial window shall be automatically granted on the sixty-first (61st) day after the Commission shall have given such public notice of its acceptance for filing, unless prior to such date either a party in interest timely files a formal petition to deny or for other relief pursuant to §74.912 or the Commission notifies the applicant that its application will not be automatically granted. On the sixty-first (61st) day after the publication of such second public notice, applications for response station hub and booster station hub authorizations may be filed and will be processed in accordance with the provisions of §§ 74.939 and 74.985.

EXPLANATORY NOTE — This provision is intended to conform the ITFS filing rules to the MDS filing rules, and is more fully explained in the explanatory notes to §§21.27, 21.909 and 21.913. The Petitioners contemplate that as with existing MDS booster and response stations, the Commission will afford an opportunity for existing ITFS booster and response station users to file the information necessary for them to secure grandfathered status and be protected by facilities proposed during the contemplated one-week window and thereafter.

26. Section 74.912(a) is revised as follows:

(a) Any party in interest may file with the Commission a petition to deny any application for new facilities or major changes in the facilities of authorized stations, provided such petitions are filed by the date established pursuant to the cut-off provisions of §74.911(c). In the case of all other applications, except those excluded under Section 309(c) of the Communications Act of 1934, as amended, and except as provided in §§74.939 and 74.985, petitions to deny must be filed not later than 30 days after issuance of a public notice of the acceptance for filing of the applications. In the case of applications for renewal of license, petitions to deny may be filed after the issuance of a public notice of acceptance for filing of the applications and up until the first day of the last full calendar month of the expiring license term. Any party in interest may file with the Commission a petition to deny any notification regarding ITFS booster stations within the 60 day period provided for in §74.985(e).

EXPLANATORY NOTE — The proposed revision is necessary to conform this section to the current provision of §74.985, which provides interested parties 60 days to oppose low power booster stations for which notifications are filed and which the Petitioners do not propose to change.

27. Sections 74.931 is revised as follows:

§74.931 Purpose and permissible service.

(a)(1) Instructional television fixed stations are intended primarily to provide a formal educational and cultural development in aural and visual form, to students enrolled in accredited public and private schools, colleges and universities. Authorized instructional television fixed station channels must be used to transmit formal educational programming offered for credit to enrolled students of accredited schools or for response channels employed in connection with formal educational courses offered for credit to enrolled students of accredited schools, with limited exceptions as set forth in paragraph (e)(9) of this section and §§74.990 through 74.992 of this part.

* * *

(b) Such stations may also be used for the additional purpose of transmitting other visual and aural educational, instructional and cultural material to selected receiving locations, including in-service training and instruction in special skills and safety programs, extension of professional training, informing persons and groups engaged in professional and technical activities of current developments in their particular fields, and other similar endeavors, and for transmitting associated information from ITFS response stations to response station hubs.

* * *

(e) A licensee may use excess capacity on each channel to transmit material other than the ITFS subject matter specified in paragraphs (a), (b), (c), and (d) of this section subject to the following conditions:

* * *

(2) If the time or capacity leased is to be used for "wireless cable" operations (the provision of video, voice and/or data services to subscribers), before leasing excess capacity on any one channel, the licensee must provide at least 20 hours per week of ITFS programming on that channel, except as provided in paragraph (e)(3) of this section. All hours not used for ITFS programming may be leased to a "wireless cable" operator. A total of 40 ~~An additional 20~~ hours per week per channel must be used for ITFS programming or reserved for recapture by the ITFS licensee for its ITFS programming, subject to one year's advance, written notification by the ITFS licensee to its "wireless cable" lessee. These hours of recapture are not restricted as to time of day or day of the week, but may be established by negotiations between the ITFS licensee and the "wireless cable" lessee.

* * *

(9) A licensee may shift its requisite ITFS programming onto fewer than its authorized number of channels, via channel mapping technology or channel loading, so

that it can lease full-time channel capacity on its ITFS station, associated ITFS booster stations or on ITFS response stations and associated response station hubs to a wireless cable operator, subject to the condition that it provide a total average of at least 20 hours per channel per week of ITFS programming either on its authorized channels or on channels not authorized to it, but which are included in the wireless system of which it is a part. The use of channel mapping or channel loading in accordance with the preceding sentence shall not be considered adversely to the ITFS licensee in seeking a license renewal or otherwise. The licensee also retains the unbridgeable right to recapture, subject to six months' written notification to the wireless cable operator, such additional hours as are necessary to afford it an average of ~~an additional 20~~ 40 hours per channel per week for simultaneous programming on the number of channels for which it is authorized. The licensee may agree to the transmission of this recapture time on channels not authorized to it, but which are included in the wireless system of which it is a part.

* * *

EXPLANATORY NOTE — The proposed revisions to subsections (a) and (b) are intended to reflect that as ITFS licensees secure interactive capabilities, the fundamental nature of how ITFS spectrum is employed will change. Content used in connection with the education of students will flow both to receive sites, and from receive sites to response station hubs.

The proposed revisions to subsection (e)(2) achieve two objectives. First, they provide clarity as to what constitutes "'wireless cable' operations" in an environment where wireless cable operators, like their wired cable brethren, will have to provide a full panoply of service offerings to consumers in order to remain competitive. Second, the proposed revisions clarify the minimum recapture rule to provide that where an ITFS licensee utilizes more than 20 hours per channel per week for ITFS programming, it must only preserve the right to recapture additional hours that would give it a total of 40 hours of actual use and recapture time per week per channel. Historically, the Commission has required ITFS licensees engaged in leasing of excess capacity to preserve at least 40 hours each week per channel for the transmission of ITFS programming. This 40-hour preservation could consist of any combination of airtime actually used to transmit ITFS programming and airtime subject to ready recapture, provided that the minimum actual use requirements of §§74.931(e)(2) and (3) are met. Thus, for example, an ITFS licensee that actually transmitted thirty hours per channel per week of ITFS programming was only required to reserve for ready recapture an additional ten hours. When the Commission amended §74.931(e)(2) in its 1994 Report and Order in MM Docket No. 93-106, it inadvertently revised that subsection in a manner that appears to require the preservation of 20 hours per week per channel of ready recapture time, even if the ITFS licensee is actually transmitting more than the 20 hours per channel per week ITFS programming minimum. That clearly was not the Commission's intent -- there is nothing in the Report and Order to suggest that the Commission intended to alter its historic policies regarding the amount of ready recapture time that must be made available to those ITFS licensees that actually utilize more than the 20-hour minimum. See Petition of Wireless Cable Ass'n Int'l, MM Docket No. 93-106, at 21-23 (filed Aug. 12, 1994). To eliminate any confusion, the Petitioners suggests that §74.931(e)(2) be revised to provide that an ITFS licensee engaged in channel mapping or channel loading need only preserve for ready recapture an amount of airtime per channel equal to 40 hours less the number of hours actually employed for ITFS transmissions. Similar conforming changes to §74.931(e)(9) are also proposed.

As noted above in the explanatory note to §74.902(d), it will likely be essential that several contiguous channels be made available for return path use in order to avoid unnecessary duplication of guard bands. In order to accomplish that task, it may be necessary for an ITFS licensee to make its entire spectrum allocation available for return paths, and to meet its minimum programming requirements on other channels within the system. The Commission has previously acknowledged that "[i]n today's market environment, MMDS channels and ITFS channels are interrelated components of an integrated set of channels" and has "agree[d] that it is most practicable to view a licensee's group of four ITFS channels as an integral constituent of a market-wide set of channels used to transmit instructional and entertainment programming." See Amendment of Part 74 of the Commission's Rules Governing Use of the Frequencies in the Instructional Television Fixed Service, 9 FCC Rcd. 3360, 3364-65 (1994). The proposed revisions to subsection (e)(9) are necessary to afford ITFS licensees the flexibility to load all of their transmission needs onto channels other than their own so as to free up full time channel use for non-ITFS programming purposes. Yet, the proposed rules do not diminish by one minute the amount of time that must be made available to an ITFS licensee. If an ITFS licensee desires to make full time use of its channels available to a wireless cable operator, it must secure the right to transmit its ITFS programming on other channels. And, because the conversion of channels for return path use requires the consent of the ITFS licensee, each ITFS licensee will retain the ability to use its own channels, if that is a matter of importance to it. No wireless cable operator will be able to force its ITFS lessors to abandon use of their assigned channels.

28. Sections 74.936 is revised as follows:

(a) An instructional television fixed station shall normally employ amplitude modulation (C3F) for the transmission of the visual signal and frequency modulation (F3E) or (G3E) for the transmission of the aural signal when transmitting a standard television signal. For purposes other than standard television transmission, different types of emissions may be authorized if the applicant describes fully the modulation and bandwidth desired, and demonstrates that the bandwidth desired is no wider than needed to provide the intended service.

(b) On or after November 1, 1991, the maximum out-of-band power of a transmitter or of a booster transmitting on a single channel with effective isotropic radiated power in excess of -9 dBW operating in this service utilizing analog modulation shall be attenuated 38 dB relative to the peak visual carrier at the channel edges and constant slope attenuation from this level to 60 dB relative to the peak visual carrier at 1 MHZ below the lower band and 0.5 MHZ above the upper band edge. All out-of-band emissions extending beyond these frequencies shall be attenuated at least 60 dB below the peak visual carrier power. The maximum out-of-band power of a transmitter or of a booster transmitting on a single channel or portion thereof with effective isotropic radiated power in excess of -9 dBW employing digital modulation shall be 38 dB attenuation relative to the licensed average power level (or, when subchannels are used, the appropriately adjusted value based upon the ratio of the channel-to-subchannel bandwidths) at the licensed channel edges, constant slope attenuation from that level to 60 dB attenuation at 3 MHZ above the upper and below the lower licensed channel edges, and 60 dB attenuation below the licensed average power level (or, when subchannels are used, the appropriately adjusted value based upon the ratio of the channel-

to-subchannel bandwidths) at all other frequencies. Notwithstanding the foregoing, in situations where a booster station transmits, or where adjacent channel licensees jointly transmit, over more than one channel utilizing digital modulation, the maximum out-of-band power shall be 38 dB attenuation relative to the licensed average power level of each channel at the channel edges of those combined channels, constant slope attenuation from that level to 60 dB attenuation at 3 MHZ above the upper and below the lower edges of those combined channels, and 60 dB attenuation below the licensed average power level of each channel at all other frequencies. However, should interference occur as a result of emissions outside the assigned channel, additional attenuation may be required. A transmitter licensed prior to November 1, 1991, that remains at the station site initially licensed, and does not comply with this subsection, may continue to be used for its life if it does not cause harmful interference to the operation of any other licensee. Any non-conforming transmitter replaced after November 1, 1991, shall be replaced by a transmitter meeting the requirements of this subsection.

(c) The maximum out-of-band power of a booster transmitting on multiple channels carrying separate signals (a "broadband" booster) with an effective isotropic radiated power in excess of -9 dBW, employing either analog or digital modulation, shall be attenuated 38 dB relative to the peak visual carrier at the channel edges of channels occupied by analog signals and relative to the licensed average power level at the edges of channels occupied by digital signals. Within unoccupied channels within the overall passband of the booster, the maximum out-of-band power shall be attenuated 50 dB at 3 MHZ above the upper and below the lower edges of occupied channels. For boosters operating in the range 2.500-2.690 GHz, the maximum out-of-band power shall be attenuated 50 dB at 3 MHZ above the upper and below the lower of these frequencies, constant slope attenuation to 60 dB at 20 MHZ above the upper and below the lower of these frequencies, and 60 dB attenuation at all frequencies beyond. Boosters operating with an effective isotropic radiated power less than -9 dBW shall have no particular out-of-band power attenuation requirement, except that if they cause harmful interference, their operation shall be terminated within 2 hours upon notification by the Commission until the interference can be cured.

(d) The maximum out-of-band power of a response station using all or part a 6 MHZ channel and employing digital modulation shall be 38 dB attenuation relative to the rated power level at the 6 MHZ channel edges, constant slope attenuation from that level to 60 dB attenuation at 3 MHZ above the upper and below the lower channel edge, and 60 dB attenuation below the rated power level at all other frequencies. Notwithstanding the foregoing, in situations where response stations transmit over more than one 6 MHZ channel utilizing digital modulation, the maximum out-of-band power shall be 38 dB attenuation relative to the rated power level within each channel at the channel edges of those combined channels, constant slope attenuation from that level to 60 dB attenuation at 3 MHZ above the upper and below the lower edges of those combined channels, and 60 dB attenuation below the rated power level of each channel at all other frequencies. Notwithstanding either of the two foregoing sentences, the out-of-band power for discrete spurious signals above the upper and below the lower channel edge shall not be less than 40 dB attenuation, provided that such signals occur no more frequently than once in any 10 MHZ within 50 MHZ of a channel edge and none occur more than 50 MHZ from a channel edge). However,

should harmful interference occur as a result of emissions outside the assigned channel, additional attenuation may be required.

(ec) The requirements of §73.687(c)(2) will be considered to be satisfied insofar as measurements of operating power are concerned if the transmitter is equipped with instruments for determining the combined visual and aural operating power. However, licensees are expected to maintain the operating powers within the limits specified in §74.935. Measurements of the separate visual and aural operating powers must be made at sufficiently frequent intervals to insure compliance with the rules, and in no event less than once a month. However, the provisions of §73.687(c)(2) and of this subsection shall not be applicable to ITFS response stations or to low power ITFS booster stations authorized pursuant to §74.985(e).

EXPLANATORY NOTE — The revisions to subsection (a) are intended to conform to §21.905(b) and accommodate the use of different modulations schemes. The revisions to subsection (b) and the addition of subsection (c) are intended to conform to §21.908. The revisions to subsection (c) are to make clear that the restrictions set forth therein do not apply to ITFS response station or low power ITFS booster station transmitters. For the reasons set forth above, it would not be practical, and it is not necessary, to impose such requirements on those devices.

29. Sections 74.937(a) and (b) are revised as follows:

(a) In order to minimize the hazard of harmful interference from other stations, directive receiving antennas should be used at all receiving locations other than response station hubs. The choice of receiving antennas is left to the discretion of the licensee. However, for the purpose of interference calculations, except as set forth in §74.939, the general characteristics of the reference receiving antenna shown in Figure 1 of this section (i.e., a 0.6 meter (2 foot) parabolic reflector antenna) are assumed to be used in accordance with the provisions of §74.903(a)(3) unless pertinent data is submitted of the actual antenna in use at the receive site. Licensees may install receiving antennas with general characteristics superior to those of the reference receive antenna. Nevertheless, should interference occur and it can be demonstrated by an applicant that the existing antenna at the receive site is inappropriate, a more suitable yet practical receiving antenna should be installed. In such cases, the modification of the receive site will be in the discretion, and will be the responsibility, of the licensee serving the site.

(b) Except as set forth in §74.931(e)(7), dDirective transmitting antennas shall be used whenever feasible so as to minimize interference to other licensees. The radiation pattern shall be designed to minimize radiation in directions where no reception is intended. When an ITFS station is used for point-to-point service, an appropriate directional antenna must be used.

EXPLANATORY NOTE — The revisions to subsection (a) reflect the fact, discussed in detail in the explanatory note to §21.909, that response station hubs are multipoint-to-point in nature. The revision to subsection (b) is intended to eliminate an ambiguity and make clear the Commission's

intention that ITFS licensees which lease to wireless cable operators can secure authority to utilize an omnidirectional transmission antenna, even if such antenna pattern is unnecessary to serve the licensee's own educational receive sites. See Amendment of Parts 21, 43, 74, 78 and 94 of the Commission's Rules Governing Use of the Frequencies in the 2.1 and 2.5 GHz Bands, 6 FCC Rcd 6764, 6774 (1991).

30. Section 74.938(a) is amended as follows:

> (a) The width of an ITFS channel is 6 MHZ. However, the licensee may subchannelize its authorized bandwidth, provided that digital modulation is employed and the aggregate power does not exceed the authorized power for the channel, and may utilize all or a portion of its authorized bandwidth for ITFS response stations authorized pursuant to §74.939. The licensee may also, jointly with affected adjacent channel licensees, transmit utilizing bandwidth in excess of its authorized bandwidth, provided that digital modulation is employed, all power spectral density requirements set forth in this Part are met and the out-of-band emissions restrictions set forth in §74.936 are met at the edges of the channels employed. ITFS transmitters must be type accepted by the Commission for the particular ~~visual and aural~~ signals that will be employed in actual operation. Either the manufacturer or the licensee must obtain transmitter type acceptance for the transmitter by filing an application for type acceptance with appropriate information concerning the signal waveforms and measurements.

EXPLANATORY NOTE — The proposed revision accommodates the subchannelization that will be employed for two-way communications, and conform to proposed §21.905(b). As explained in the explanatory note to that section, the Petitioners contemplate that ITFS licensees in the future may desire to employ transmission systems that utilize less than 6 MHZ for each channel of communications, particularly for communications between the ITFS response station and the response station hub. The proposed revisions provide ITFS licensees with the requested flexibility to subchannelize their 6 MHZ bandwidth as necessary to provide an array of digital communications services (subject, of course, to compliance with restrictions on power (including the uniform power requirements of the Digital Declaratory Ruling) and out-of-band emissions at the channel edges). Similarly, the Petitioners believe that innovative transmission techniques can be promoted by allowing adjacent channel licensees to jointly transmit a digital signal with a bandwidth in excess of 6 MHZ. For example, buried spread spectrum (which could make it possible to use the same spectrum for both upstream and downstream communications), may require the use of code division multiplexing, which in turn may require bandwidth in excess of 6 MHZ if the data rate needs of certain applications are to be met. The Petitioners submit that where adjacent channel licensees desire to jointly transmit a single signal over all or part of their combined bandwidth, they should be permitted to do so, subject to the use of digital modulation and compliance with the out-of-band emissions restrictions set forth in §74.936 at the edges of the channels actually used and the uniform power requirements of the Digital Declaratory Ruling. Of course, in order to avail themselves of this opportunity, the adjacent channel licensees will have to be authorized to operate facilities that are functionally identical, save for the authorized operating frequencies. As discussed previously, while the Petitioners are proposing that all subchannel or superchannel use employ digital modulations in order to avoid the need for multiple interference protection standards, applicants should be permitted to employ analog subchannels or superchannels on a waiver basis upon a

showing of non-interference. Finally, elimination of the phrase "visual and aural" accommodates the fact that modulation techniques will be employed that do not have such signals. See Digital Declaratory Ruling, *at* ¶47.

31. Section 74.939 is revised as follows:

(a) An ITFS response station is authorized to provide communication by voice, video and/or data signals with its associated ITFS response station hub ~~instructional television fixed station for use in instructional or computer-assisted communications. Other communications concerning the technical operation of the system may be carried on when necessary~~. ~~(b)~~ An ITFS response station may be operated only by the licensee of an instructional television fixed station and only at an authorized receiving location of the instructional television fixed station, by any lessee of excess capacity, or by a subscriber of any lessee of excess capacity ~~with which it communicates~~. More than one ITFS response station may be operated at the same or different locations by the same licensee. The specific frequency channel may be subdivided to provide a distinct operating frequency for each of more than one response station, provided that digital modulation is employed and the aggregate power does not exceed the authorized power for the channel. An ITFS response station may also transmit utilizing bandwidth in excess of that authorized to the licensee jointly with effective adjacent channel licensees, provided that digital modulation is employed, all power spectral density requirements set fort in this Part are met and the out-of-band emission restrictions set forth in §74.936 are complied with.

(b) ITFS response stations that utilize the bands 2500-2650 MHZ, 2656-2662 MHZ, 2668-2674 MHZ and/or 2680-2686 MHZ or the 125 KHz channels identified in §74.939(f) may be installed and operated without an individual license to communicate with a response station hub authorized to an ITFS licensee under a response station hub authorization, provided that the conditions set forth in §74.939(e) are complied with and that ITFS response stations operating in the bands 2500-2650 MHZ, 2656-2662 MHZ, 2668-2674 MHZ and/or 2680-2686 MHZ only employ digital modulation.

(c) An application for a response station hub authorization ~~authority to operate a new or modified response station~~ shall be filed with the Commission in Washington, D.C., on FCC Form 330. Section VI of that form shall supply the following information for each response station hub:

(1) The geographic coordinates, street address, and the height of the center line of the reception antenna(s) above mean sea level for the response station hub; and

(2) A specification of:

(A) The response service area in which the applicant or its lessee proposes to install ITFS response stations to communicate with the response station hub, any regions into which the response service area will be subdivided for purposes of interference analysis, and any regional classes of response station characteristics which will be used to define the operating parameters of groups of response stations within each region for

purposes of interference analysis, including:

(i) the maximum height above ground level of the transmission antenna that will be employed by any response station in the regional class and that will be used in interference analyses without the receipt of additional, site-specific authorization; and

(ii) the maximum equivalent isotropic radiated power (EIRP) that will be employed by any response station in the regional class and that will be used in interference analyses; and

(iii) any sectorization that will be employed, including the polarization to be employed by response stations in each sector and the geographic orientation of the sector boundaries, and that will be used in interference analyses; and

(iv) the combined worst-case outer envelope plot of the patterns of all models of response station transmission antennas that will be employed by any response station in the regional class to be used in interference analyses; and

(v) the maximum number of response stations that will be operated simultaneously in each region using the characteristics of each regional class applicable to each region.

(B) The channel plan (including any guardbands at the edges of the channels) to be used by ITFS response stations in communicating with the response station hub, including a statement as to whether the applicant will employ the same frequencies on which response stations will transmit to also transmit on a point-to-multipoint basis from an MDS station or MDS booster station; and

(C) The minimum received signal level that the proposed response station hub can actually utilize in the provision of service, specified in $dBW/m^2/Hz$; and

(3) A demonstration that:

(A) The proposed response station hub is within the protected service area of the ITFS station whose channels will be used for communications to the response station hub (for purposes of this rule, an ITFS station that is not engaged in leasing of excess capacity will be deemed to have a 35 mile radius protected service area centered at its transmitter site) or, in the case of an application for response stations to utilize one or more of the 125 kHz response channels, the response station hub is within the protected service area of the station authorized to utilize the associated channel; and

(B) The entire proposed response service area is within the protected service area of the ITFS station whose channels will be used for communications to the response station hub, (for purposes of this rule, an ITFS station that is not engaged in leasing of excess capacity will be deemed to have a 35 mile radius protected service area centered at its transmitter site) or, in the alternative, the applicant may demonstrate that the